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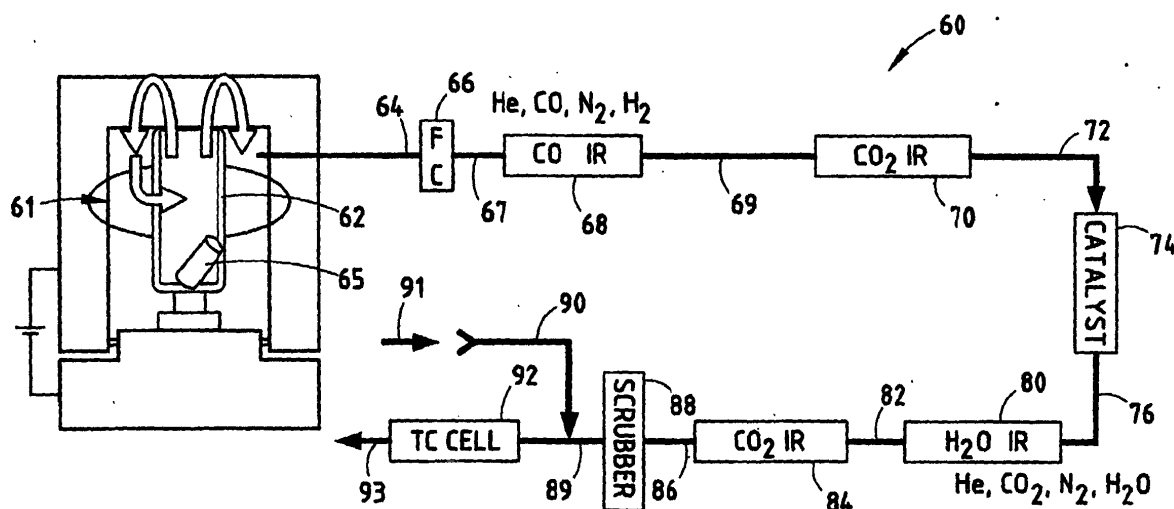
(30) Priority: **26.10.2001 US 35716**

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(54) **Sample analyzer comprising a fusion furnace and a conduit with gas detectors, using inert carrier gas**

(57) A single pass analyzer includes multiple infra-red sensors (68,70,80,84), a catalytic converter (74), a scrubber (88) and a thermal conductivity cell (92) all coupled in series to provide a single pass (*i.e.*, one sample) analyzer which allows for fast analysis, allows for

the speciation of hydrogen samples, requires no purging between different sample types, utilizes a single carrier gas, and eliminates molecular sieves and Shutze converters. The resultant analyzer provides improved quicker results with less plumbing (*i.e.*, gas conduits and valving) in a single instrument.

**FIG. 5****EP 1 306 670 A3**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 02 25 6931

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 622 009 A (BREDEWEG ROGER L) 11 November 1986 (1986-11-11) * abstract; figures 1,2 * * column 2, line 15 - column 8, line 26 * -----	1-4,11, 12	G01N31/12
A	US 4 705 669 A (TANIMOTO MASAHIRO ET AL) 10 November 1987 (1987-11-10) * column 1, line 7 - column 4, line 21; figures 2-5 * * column 4, line 45 - column 8, line 64 * -----	1-4,11, 12	
P,A	EP 1 207 390 A (LECO CORP) 22 May 2002 (2002-05-22) * abstract; figures 4,5 * * paragraphs [0008] - [0022] * -----	1-4,11, 12	
A	US 3 985 505 A (BREDEWEG ROGER L) 12 October 1976 (1976-10-12) * abstract; figures 1-3 * * column 2, line 47 - column 10, line 17 * -----	1-4,11, 12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G01N
<p><del>The present search report has been drawn up for all claims</del></p>			
Place of search		Date of completion of the search	Examiner
Munich		26 October 2004	Klein, M-O
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)



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### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

see annex



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LACK OF UNITY OF INVENTION  
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1,2,3,4,11,12

single pass analyzer for the detection of hydrogen, nitrogen and oxygen, comprising furnace, catalyst, four infrared detectors and a thermal conductivity cell

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2. claims: 5,6,8

method of determining hydrogen in form of hydrogen compounds by heating the sample above 1500 degrees celsius and the byproducts in an analyte stream and detection of hydrogen compounds

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3. claims: 7,9,10

analyzer for detection of hydrogen comprising copper oxide catalyst, H<sub>2</sub>O IR-detector for detecting hydrogen as H<sub>2</sub>O

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 6931

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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26-10-2004

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